

State of North Carolina  
Department of Environment,  
Health and Natural Resources  
Division of Solid Waste Management

James B. Hunt, Jr., Governor  
Jonathan B. Howes, Secretary  
William L. Meyer, Director

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To PAUL BANKS	From BOBBY LUTFY	
Co. E.S.I.	Co. SOLID WASTE SECT.	
Dept.	Phone # 919-733-0692	
Fax # 704-521-8004	Fax # 919- <del>521</del> 733-4810	

January 11,

Mr. Paul A. Banks  
Ecological Services, Inc.  
P.O. Box 12146  
Charlotte, N.C. 28220

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To JAN MCHARGUE	From BOBBY LUTFY	
Co. SOLID WASTE SECTION	Co. SOLID WASTE SECT.	
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RE: Hydrogeologic Review Of The North Mecklenburg Construction And  
Demolition Landfill (Permit # 60-13)

Dear Mr. Banks,

bc b u io DIN

There are two primary concerns when evaluating hydrogeologic information relating to the design of a C&D landfill facility:

- (1) Solid Waste Management rules and policy require a minimum four foot vertical separation between the bottom elevation of solid waste and the seasonal high water table and/or bedrock; and
- (2) There must be a sufficient understanding of the ground-water flow regime of the uppermost aquifer to design an effective ground-water monitoring system.

There are still some unanswered questions regarding both of these basic concerns.

#### VERTICAL SEPARATION REQUIREMENTS:

Although there is still limited information on seasonal high water table data, the recent revisions to the grading plan appear sufficient to address the vertical separation requirements from the seasonal high water table.

Since relatively few borings were placed in the proposed landfill footprint, there is only limited information on top of bedrock elevations. Top of bedrock is generally defined as auger refusal or Standard Penetration Resistance (SPR) values of about 50/0.2', since this approximates the limits of excavation using normal grading equipment. Since most of the subsurface investigation at this site was done with air rotary drill rigs, there is very little auger refusal or SPR data available.

There is a problem in meeting the four foot vertical separation from bedrock requirement at boring location SB-3. The boring log for this boring does not have the survey elevations recorded. However it appears on the Grading Plan that boring SB-3 is located at an elevation of approximately 752. Auger refusal was encountered at a depth of about 14 feet, or an elevation of about 738. Therefore in order to maintain the minimum four foot of vertical separation, the base grade must be about 742. The base grade that appears on the Grading Plan at location SB-3 is about 730. Based on the data provided, this means the proposed excavation is about 12 feet deeper than that allowed by the rules.

Regarding the vertical separation from bedrock requirements, North Mecklenburg C&D Landfill has two options: 1) the grading plan can be revised to maintain the vertical separation from bedrock, or 2) further subsurface investigation using an auger drill rig and obtaining SPR values can be done to more clearly identify the top of bedrock surface for the proposed landfill area.

#### **GROUND-WATER MONITORING SYSTEM DESIGN:**

In order to design an effective ground-water monitoring system a good understanding of the hydrogeology of the site is necessary. The small map used to illustrate the Phreatic Surface Contours (Figure 7) appears somewhat distorted. The facility boundary measurements do not match those of the larger plan sheets or the boundary survey submitted with the initial permit application. Typically a large scale ground-water contour map is prepared that accurately portrays the ground-water equipotential lines superimposed over ground topography. The map should also show the actual boring locations and piezometer data used to generate the ground-water contours. It would be helpful in evaluating the site if such a ground-water contour map were submitted.

At this time the Solid Waste Section does not have a copy of the initial sampling data and well construction records for the initial phase of landfill development as required by the original permit to operate. We have received sampling data for sampling events performed in January and September, 1994. No well completion records or boring logs have been provided for wells MW-1 and MW-2.

Virtually none of the monitoring wells that have been installed at the site meet the design standards of the Solid Waste Section. In addition to the basic design requirements of the N.C. Well Construction Standards, 15A NCAC 2C, the Solid Waste Section has certain requirements for the location and design of monitoring wells at landfills. In order to limit dilution of chemical constituents and to limit possible spread of contamination, well screens should normally not exceed 15 feet in length. The sand filter pack should extend no more than one foot below the screen or two feet above the screen. Generally shallow monitoring wells are screened at the water table with a 15 foot screen set so that the top of the screen is just above the seasonal high water table. Deeper wells are generally constructed with ten foot well screens.

Ecological Services, Inc. should prepare a summary table of well construction details and stabilized water table data and evaluate the existing wells at the North Mecklenburg Landfill site based upon the above referenced criteria. Also monitoring wells should generally be located at least 50 feet within the permitted facility boundary and about 100 to 150 feet from the waste boundaries.

The proposed monitoring system is not adequate. No background (upgradient) monitoring well has been proposed. Proposed monitoring wells MW-3 and PZ-6 are in the footprint of the waste disposal area. Since this permit application is for a lateral expansion, and the potentiometric map indicates radial ground-water flow at the site, the monitoring system should be designed to effectively monitor all facility boundaries for both Phase I and Phase II of the site.

#### OTHER ISSUES:

- The phreatic surface shown on the cross-sections differs from the phreatic surface illustrated on the Phreatic Surface Contour Map. Based on the groundwater elevations in Table 5, it appears that the phreatic surface shown on the cross-sections are plotted incorrectly. A flat phreatic surface line as plotted on Cross-section A-A' does not appear realistic given the variable topography.

- Several maps (Figure 4) show two locations for well MW-1. References from the earlier permit application indicate an old well No. 1 that was not recommended for further monitoring. Please clarify the issue of having two monitoring wells designated as MW-1. Provide well records and boring logs for both wells. Which of these wells has been monitored as part of the detection monitoring system for Phase I?

Clarifications are needed for these issues before the technical review can be completed and a permit to construct can be issued. In order to expedite the permitting process, the Solid Waste Section is scheduling an on-site meeting to discuss what needs to be done in order to proceed with landfill development. If you have any questions, please contact the Solid Waste Section at (919) 733-0692.

Sincerely,

*Bobby Lutfy*

Bobby Lutfy  
Hydrogeologist  
Solid Waste Section

cc: Jan McHargue, Solid Waste Section, Winston-Salem Reg. Office  
Jim Bateson, Solid Waste Section, Raleigh Central Office  
Rick Doby, Solid Waste Section, Mooresville Regional Office  
Larry Griffin, North Mecklenburg Landfill  
Frank Hicks, Consulting Engineer